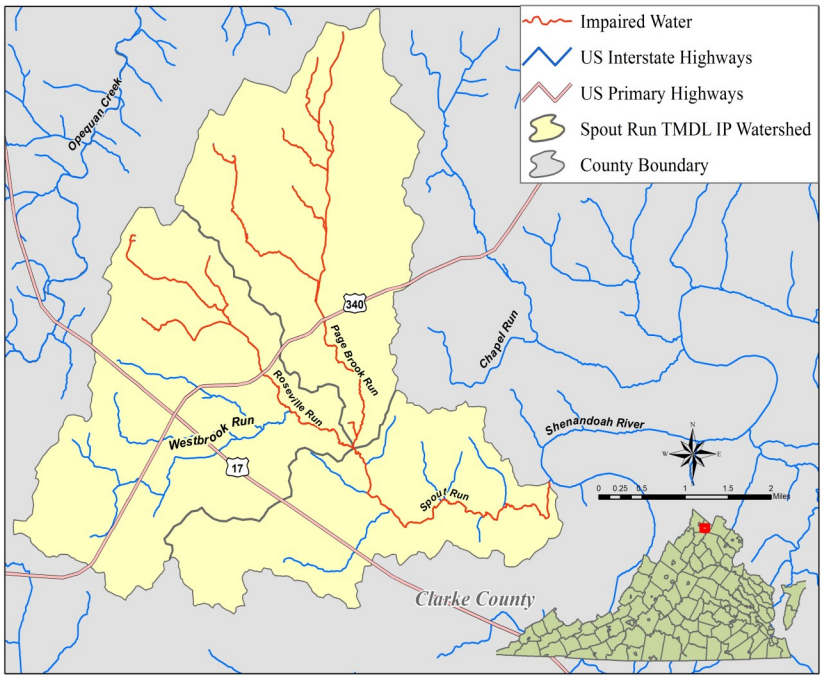
TMDL Project Closeout Report
SPOUT RUN WATERSHED

Virginia Nonpoint Source
MANAGEMENT PROGRAM

Project Location and Background

The Spout Run watershed is located in the Shenandoah River Basin in Clarke County, Virginia. The watershed is approximately 13,710 acres in size, and land use is predominantly agricultural (66%) and forested (26%). Spout Run and its tributaries Page Brook and Roseville Run were listed as impaired on Virginia's 1998, 2004, and 2010 *Section 303(d) Total Maximum Daily Load (TMDL) Priority List and Report*, respectively, due to violations of the State's Water Quality Standard for fecal coliform bacteria. In addition, Spout Run was listed for violating the General Standard (benthic) in the 1998 Report. The Spout Run TMDL was completed in February 2010. A stressor analysis performed during TMDL development identified sediment as the primary stressor causing the aquatic life use impairment in Spout Run. A TMDL implementation plan was completed in September 2012, and the implementation project started in January 2014.



Implementation Highlights

The Spout Run TMDL implementation project was administered by Clarke County in partnership with the Lord Fairfax Soil and Water Conservation District (LFSWCD). The LFSWCD was responsible for the agricultural program, while the County addressed residential septic and urban aspects of the implementation plan. The table on the right shows BMPs implemented since the project began in January 2014 and overall implementation goals for the project area. The overall BMP list of project goals is extensive, so only those included within the scope of the implementation project are shown here.

A National Fish and Wildlife Foundation Chesapeake Bay Stewardship Fund grant supported additional project activities including an innovative outreach campaign featuring short video documentaries of restoration projects. Additional streambank stabilization work was completed through this grant, along with a series of residential/urban stormwater BMPs.

(continued on page 2)

Table 1: Spout Run BMP Summary: January 2014—June 2017

Control Measure	Units	Goal	Installed	%
Agricultural				
Stream Exclusion Fencing	F	109,403	21,851	20
Riparian Buffer	A	12	12	100
Grazing Land Management	A	812	548.5	68
Small Ac. Grazing System	A	282	0	0
Vegetative Cover on Cropland	A	8	49	613
Barnyard Runoff Controls	A	17	0	0
Equine Manure Storage Fac.	S	8	0	0
Equine Manure Composting	S	5	0	0
Residential Septic				
Septic Tank Pump-out	S	67	28	42
Septic System Repairs	S	16	5	31
Connection to Public Sewer	S	N/A	1	N/A
Septic System Installation	S	19	0	0
Alternative Waste Treatment System	S	4	1	25
Residential/Urban				
Turf to Trees Plantings	A	15	2	13
Pet Waste Composters	S	10	0	0
Wetland Restoration	Ac-T	N/A	2	N/A
Streambank Stabilization	F	20,838	2,000	10

A = Acres, F = Linear Feet, P = Program, S = System, Ac-T = Acres Treated

Implementation Highlights— Continued

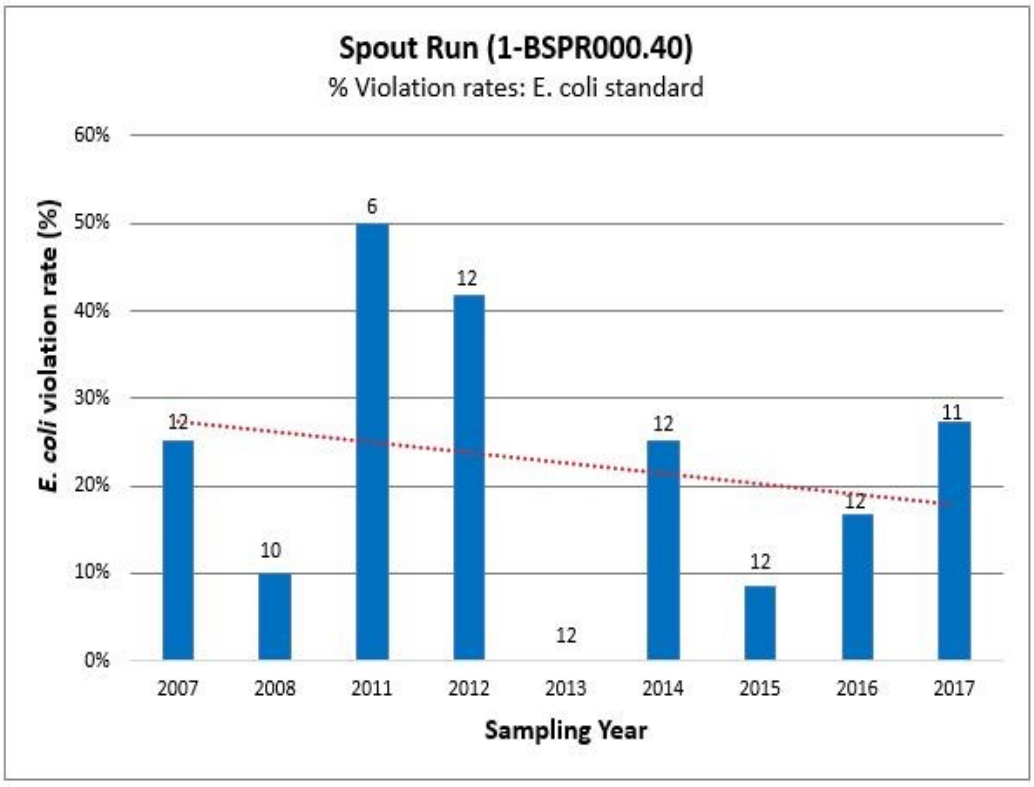
Initial participation in the septic BMP program was limited, and very low levels of interest were shown in the pilot equine BMPs offered through the LFSWCD. As a result, funds were redirected to additional livestock stream exclusion fencing projects. Pollution reductions resulting from the agricultural and septic BMP installations since the project's inception are summarized in Table 2 below. These reductions do not include those associated with pet waste, wetland restoration, and streambank stabilization BMPs shown in Table 1 above..

Period	Pathogens (Coliform) (CFU)	Nitrogen (lbs/year)	Phosphorus (lbs/year)	Sedimentation (tons/year)
January 2014-June 2017	6.58E+14	6,397	1,151	1,066

Table 2: Pollution Reductions for Spout Run Watershed

Water Quality Monitoring Results

Water quality data collected by DEQ for the period of 2007 through 2017 were analyzed to determine the impact of BMPs implemented in the project area on *E. coli* violation rates and associated long-term trends, if any, in water quality improvements. The bar graph on the right shows the percent violation rates for samples collected at monitoring station 1-BSPR000.40, located near the mouth of Spout Run, which did not meet the water quality standard of 235 cfu/100 mL. The number of samples collected each year is shown above each bar. The linear regression fitted to the data shows a decreasing trend in violation rates over the sampling period, indicating possible improvements in water quality in Spout Run.



Graph 1: *E.coli* data for Spout Run (Station 1-BSPR000.40), 2007-2017

The Virginia Nonpoint Source Management Program: The Virginia NPS Management Program is managed by the Virginia Department of Environmental Quality (DEQ) and is funded, in part, through grants from the U.S. Environmental Protection Agency, under the Clean Water Act Section 319(h). For more information regarding Virginia's Nonpoint Source Management Program, please visit us on the web at: http://www.deq.virginia.gov/Programs/Water/WaterQualityInformationTMDLs/NonpointSourcePollutionManagement.aspx . An electronic copy of this report can be found here: http://www.deq.virginia.gov/Programs/Water/WaterQualityInformationTMDLs/TMDL/TMDLImplementation/TMDLImplementationProjects.aspx General NPS Program questions? email: npsgrants@deq.virginia.gov

Project Funding

A total of $784,993 was spent in federal and state funds and local match to implement the BMPs listed previously. Funds totaling $218,513.06 in residential septic and agricultural BMP cost-share were provided to landowners in the watershed between July 1, 2014 and June 30 2017 through a Section 319(h) grant and the VA Agricultural Cost-Share Program. A total of $58,812 of Federal Section 319(h) funds were provided for the construction of stream restoration and urban practices. And $10,569.69 of Section 319(h) funds were used to design and install stormwater BMPs and provide technical assistance to area residents for BMP installation. A total of $223,380.50 of federal 319(h) was spent on implementing the watershed-based plan. Match from local, federal and state partners accounted for $497,083.44 of the funds spent on this project.

Table 3: Funding by major activity within the Spout Run Watershed from 2014-2017

Type of Activity	Federal/State Funds	Match	Total
Residential	$23,845.00	$98,367.50	$122,212.50
Agriculture	$194,668.06	$227,062.21	$421,730.27
Urban	$58,826.66	$129,960.42	$188,787.08
Staff and Technical Assistance	$10,569.69	$41,693.31	$52,263.00
TOTAL	$287,909.41	$497,083.44	$784,992.85

Photos: Streambank restoration project completed to address erosion and improve habitat on Spout Run

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Closeout Analysis

The Spout Run project period was three years. Public participation and overall achievement of implementation goals was moderately successful. Highlights of the Spout Run Implementation Project included:

⇒ The original project objectives focused on installation of demonstration BMP projects to address equine management including barnyard runoff controls, equine manure storage facilities, and equine manure composting. Draft specifications for some of these BMPs developed as a result of this project have been used by implementation projects in other parts of the state. Three workshops were held and other outreach efforts were made to solicit participation in installing demonstration BMPS at equine facilities. Due to low interest from equine operations, project focus was shifted to non-equine livestock exclusion practices, resulting in significant streambank protection and the creation of riparian buffers.

⇒ Although progress was made in addressing residential septic repairs and replacement, significant public interest and participation warranting continuation of the effort was not realized.

⇒ Initially, significant issues impeded the establishment of suitable sites for tree plantings and restoration projects. Ultimately the project was able to restore 1.1 acres of wetlands and 2,000 feet of streambank, as well as replace turf with over 200 trees.

⇒ Landowner cooperation was the biggest challenge to BMP implementation. Many areas for streambank restoration and riparian buffer establishment were identified, but landowners were not interested in participating.

⇒ While this project provided generous cost-share rates for property owners with septic system and equine issues, many of these property owners were uninterested.

Photos: (Upper Right) Livestock exclusion fence installed in Spout Run watershed to exclude livestock from 8,000 feet of streambank; (Lower Right) Alternative watering system installed as part of a stream exclusion project in Spout Run watershed

For More Information Please Contact:

Sara Bottenfield, DEQ TMDL NPS Coordinator,
sara.bottenfield@deq.virginia.gov, (540) 574-7872

Alison Teetor, Natural Resource Planner, Clark County
ateetor@clarkecounty.gov, (540) 955-5134

DEQ
VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY